

A SHORT
 H I S T O R Y
 OF THE
 B R O W N - T A I L M O T H,
 THE
 C A T E R P I L L A R S

of which are at present uncommonly numerous and
 destructive in the Vicinity of the Metropolis.

Illustrated by a COPPER-PLATE, coloured from Nature,
 representing the Insect in its various States.

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THE attention of the public has of late been strongly excited by the unusual appearance of infinite * numbers of large white webs, containing caterpillars, conspicuous on almost every hedge, tree, and shrub, in the vicinity of the metropolis; respecting which, advertisements, paragraphs, letters, &c. almost without number, have appeared in the several news-papers, most of which, though written with a good design, have tended greatly to alarm the minds of the people,

* Some idea may be formed of their numbers from the following circumstance. In many of the parishes about London, subscriptions have been opened, and the poor people employed to cut off and collect the webs at one shilling *per* bushel, which have been burned under the inspection of the church-wardens, overseers, or beadle, of the parish: at the first onset of this business, four-score bushels, as I was most credibly informed, were collected in one day in the parish of Clapham.

especially the weak and the timid. Some of those writers have gone so far as to assert, that they were an usual preface of the plague; others, that their numbers were great enough to render the air pestilential, and that they would mangle and destroy every kind of vegetable, and starve the cattle in the fields. From these alarming misrepresentations almost every one, ignorant of their history, has been under some dismal apprehensions concerning them; and even prayers have been offered up in some churches, to deliver us from the apprehended approaching calamity.

To give the public a true idea of the nature of these Insects, and thereby dispel their imaginary terrors; to shew what the mischiefs are which they are really capable of occasioning, and to point out the most likely means of obviating those mischiefs, are the motives which induce me to collect together and publish the notes and observations I have from time to time made concerning them, not as containing the compleatest possible history of the Insect, but such as may be expected on the spur of the occasion.

It may be remarked, in the first place, that the Insect in question is not new in this country, being every year to be found in abundance, and well known to those who collect Insects to be the Caterpillar of the *Brown-tail Moth*: nor is it peculiar to this country; but found in many parts of Europe, and has been considered, by all who have written on it, as notorious for its ravages. ALBIN, an English writer on Insects, 1720, says, that the Caterpillars of this moth lay themselves up in webs all winter, and as soon as the *Buds* open, they come forth and devour them in such a manner, that whole trees, and sometimes hedges, for a great way together, are absolutely bare. GEOFFROY, a French author, in his History

of the Insects about Paris, describes it as the most common of any with them; that it is found on most of their trees, which it often strips entirely of their foliage in the spring*.

Our great naturalist RAY also describes this Caterpillar in his *Historia Insectorum* †. It is likewise figured and described by RÖSEL, a German writer. LINNÆUS has either omitted, or confounded it with the *Phalæna Chrysoorrhæa*, or *Yellow-tail Moth*, with which it has a great affinity.

These authorities will be sufficient to shew, that it is no new Insect, and that its ravages are not unusual. It must, however, be allowed that they are, and have been the two last years, uncommonly great, and unusually extensive.

When Insects are multiplied in this extraordinary manner, it is seldom that they extend through a whole country: the precise tract which these occupy I have had no opportunity of observing. On the Kingston Road I traced them as far as Putney Common, on the farther part of which, on the trees about Coomb Wood and Richmond Park, a web was not to be seen. I remarked, that they were extremely numerous to the distance of about eight miles on the Uxbridge Road. On the Great Western Road they terminated about the Star and Garter leading to Kew; from whence to Alton in Hampshire, not one was visible; and I have received undoubted information from other quarters, that the destruction they occasion is by no means general.

* Sa Chenille a seize pattes. C'est la plus commune de toutes. Elle est velue, de couleur jaunâtre, et elle vient sur presque tous les arbres, qu'elle dépouille souvent entièrement dès les printems. GEOFFROY *Hist. abrégée des Insectes qui se trouvent aux Environs de Paris*, p. 117.

† Thus, *Eruca longis pilis fulvis hirsuta pulla; punctis albis et duobus rubris in imo dorso varia*, p. 347.

Having

Having shewn, that this insect is neither new in its appearance, nor general in its ravages, I shall endeavour to demonstrate, that there is no reason to be so dreadfully alarmed about its effects, as its powers of destruction are much more limited than is generally imagined.

Experiment teaches us, that there are some Caterpillars which are designed to feed on one kind of plant only, as the *Papilio Urticæ*, and *Io*, *small Tortoise-shell* and *Peacock Butterflies*; these are never found on any other plant than the stinging nettle. Others that are attached to two or more sorts, as the *Phalæna Verbasci*, or *Water Betony Moth*, which appears to be equally fond of the *Mullein* and *Water Betony*: while others will devour indiscriminately almost every kind of herb, shrub, or tree, as the *Phalæna Antiqua*, or *Vapourer Moth*, which I have seen to thrive on the *deadly Nightshade* and *poisonous Laurel*.

The present Caterpillar is not so limited a feeder as some, nor so general a one as others. Its whole œconomy, however, shews it designed to feed on trees and shrubs, on which alone it is ever found. These afford it a support for its web, which is an habitation in many respects essential to its existence, and with which herbaceous plants cannot supply it.

We may, therefore, with as much propriety expect to see the *Cabbage Butterfly*, *Papilio Brassicæ*, feed on our Oaks and Elms, as to find these Caterpillars destroying our Herbs or Grass.

The following facts will serve to corroborate what is here advanced. They are found on the

Hawthorn most plentifully.

Oak the same.

Elm very plentifully.

Most fruit trees the same.

Blackthorn

Blackthorn plentifully.

Rose trees the same.

Bramble the same.

On the *Willow* and.

Poplar scarce:

None have been noticed on the

Elder.

Walnut.

Ash.

Fir, or

Herbaceous Plants:

Thus it appears, that the only mischiefs these Caterpillars are capable of occasioning, is to rob particular trees and shrubs of their foliage and blossoms: it remains to consider how far the trees and shrubs will be injured by such a loss? and how far it may be injurious to their owners? I have found, by repeated observation, that those trees and shrubs which have been entirely stripped have not been killed thereby, but as soon as the Caterpillars have removed to change to Chrysalis, they have put forth fresh foliage: the only loss, therefore, the owner sustains from their depredations on those trees which are not cultivated for the sake of their fruit, is some check to their growth, and a temporary deprivation of the beauties of spring and autumn. With respect to fruit trees, the injuries they sustain are more serious ones; as in destroying the blossoms, as yet in the bud, they also destroy the fruit in embryo: the owners of orchards and standard fruit trees have therefore most reason to be alarmed.

The idea of their producing the plague, &c. is founded in the grossest ignorance, and carries with it its own refutation; the

the health of the public is not, nor cannot be affected by them, either immediately or remotely.

Some persons have been alarmed least, as they have now increased for three successive years, they should be infinitely more numerous the next. It may afford some satisfaction to those to be informed, that it is extremely probable, the trees and shrubs will not afford sufficient sustenance to the present accumulated brood; for should they be in the least stunted in their growth at the time of their changing to Chrysalis, their wings will never expand, they will be incapable of flying, and of propagating their species. It is also extremely improbable, that the same circumstances should favour their increase another year.

What the actual causes are which occasionally produce these extraordinary quantities of insects will, perhaps, for ever remain among the arcana of nature. We frequently hear that, in certain parts of the country, much damage has been sustained by the *Cock Chafer* (*Scarabæus Melolontha*); in others, that the turnips have been destroyed by a small Beetle, called the *Fly*; in others, that the same plant has been consumed by a Caterpillar of a *Tentredo**; in others, that the wheat has been eaten in the ground by a small grub, producing an *Elater*, or *Spring Beetle* †. One year the Aurelian shall find plenty of *painted Ladies* (*Papilio Cardui*); another year, with all his care, he shall not find a single one. Last year the *Sphinx Convoluti*, *Convolutus Hawk Moth*, and *Papilio Hyale*, *clouded*

* For an account of which see ALBIN, plate 62. These, Mr. FRANKLAND informed me, were highly injurious last year in some parts of Yorkshire.

† Mr. LIGHTFOOT shewed me some of these grubs; and related to me, that they were so destructive this spring about Uxbridge, that many farmers would be obliged to sow fresh grain.

Yellow Butterfly, were common about London; the naturalist may, perhaps, await six years before he sees another.

The most probable causes are, the peculiarity of the weather, and the plenty or scarcity of the enemies of the Insect; for almost every different species of Insect has its peculiar enemy, and none more than the Caterpillars of Moths and Butterflies. As to the former, warm and dry weather are universally allowed to promote the generation of Insects; violent winds, heavy and long continued rains, or extreme cold, are, on the contrary, supposed to check and destroy them. It is, however, wonderful to observe, with what address they secure themselves from the effects of the two former; such as feed on the boughs, on such occasions creep from them to the large branches on body of the tree, where they rest unshaken; and those who reside in webs are so secured as to suffer little injury from any of those causes.

We observed, that Caterpillars had many enemies. Birds of various kinds feed on them: the stomach of a cuckoo that was shot, was found full of the Caterpillars of the *Buff-tip Moth* (*Ph. Bucephala*). Mr. CHURCH, Surgeon, of Islington, has observed birds very busily feeding on the Caterpillars of this very Moth, and carrying them to their young. The Earwig is a great destroyer of Caterpillars. But their grand enemy is the *Ichneumon Fly**; a proof of whose destructive powers I experienced

* There are various kinds of flies which pierce the skin, and deposit their eggs in the bodies of Caterpillars; but the most common is the *Ichneumon Fly*. The eggs thus laid quickly produce small maggots, which feed on the body of the Caterpillar, taking care to eat that part only which lies immediately under the skin, whereby they avoid injuring those parts which are essential to life; for, should the Caterpillar be destroyed, they also would perish. Till the period

experienced last year, in attempting to breed the *large garden white Butterfly, Papilio Brassicae*. Out of twenty Caterpillars taken from the Cabbage, eighteen were stung by this Insect, and died. In proportion then as the Insect's enemies are more or less numerous, so may be the Insect itself.

We shall now proceed to give a short account of the history of the Insect which is the subject of this essay; in the course of which, we shall point out what appears to us to be the best and most effectual method of destroying them. The Caterpillar, as already has been observed, owes its origin to a Moth, called the *Brown-tail Moth*, which is about two-thirds of the size of the Moth produced from the Silk-worm, and is of a white colour throughout, excepting a streak of brown on the under side of each fore-wing, running near to, and parallel with, its anterior edge, and a brown or mouse-coloured tail, from whence it derives its name. These Moths come out of Chrysalis about the beginning of July, at which time they may be found flying about slowly, especially in the evening, and depositing their eggs on the foliage of the trees and shrubs before mentioned. The female has a much larger tuft of down on its tail than the male, a great part of which is made of their full growth arrives, the Caterpillar eats as usual, and appears equally well in health. That period arrived, which seldom happens till the Caterpillar has crept to some convenient place to chrysalize in, they eat their way out of its body, and immediately spin themselves small bags, or cases, in which they change to Chrysalis. During this operation, which continues several days, the Caterpillar apparently suffers the greatest pain, and after struggling in vain with its mortal enemy dies. When the Ichneumon Fly is small, its maggots are proportionably numerous; a hundred of them frequently proceed from one Caterpillar. The little bags which they spin to chrysalize in are frequently mistaken by the ignorant for the eggs of the Caterpillar.

use of in covering its eggs, which, when laid, look like small lumps of down on the leaves.

The young Caterpillars are hatched early in autumn: as soon as they quit the egg they set about spinning a web, and having formed a small one, they proceed to feed on the foliage, by eating the upper surface and fleshy part of the leaf, and leaving the under side and ribs. It is curious to observe with what regularity they marshal themselves for this purpose. Thus they proceed daily, spinning and enlarging their web, to which they retreat every night and in bad weather, and extending their depredations. In the course of a few weeks their operations begin to be visible on the trees; their web as yet is not so conspicuous as those leaves, which, being stripped of their green part, assume a dead appearance: now is the time to destroy them, while their nest is small, and their ravages just conspicuous. They may be cut off the twigs or branches with a pruning knife, or gardener's shears, whose handles may, if necessary, be lengthened; or by a sharp hook affixed to the end of a long pole. When cut off, they should be collected together and burned, merely to prevent their returning again to the trees and shrubs. By performing this operation thus early, you save the autumnal verdure of your foliage: if it be deferred till winter, the web will then be more conspicuous, and will have acquired a stronger and tougher texture, so as to bear pulling off, which should be preferred to pruning in certain cases, especially where it regards fruit trees. No remedy short of removing the webs will avail. Lotions, fumigations, vermin powder, &c. will be applied to no purpose; they are too strongly enveloped to be affected by any of these. In about three weeks from their being first hatched, they change their skin, a process which not only all *Caterpillars* undergo four or five

five times, at different periods of their growth, but also the *Spider*, the *Bed Bug*, and even *Lobsters* and *Crabs*. This usually takes up several days. Afterwards, they proceed in the same manner, enlarging their web, and extending their daily foraging excursions, till benumbing winter confines them entirely to their silken habitation; they then not only secure the general web on all sides as strongly as they can, to exclude impertinent intruders, but each individual spins a thin case for itself: here they rest in a state of torpid security, till the genial warmth of the spring animates them afresh, and informs them, that the all-bountiful Author of Nature hath provided food convenient for them. Thus apprized, they issue forth in the day-time and in fine weather, as before; but having acquired stronger powers, and the foliage they have now to encounter being more tender, they become less scrupulous in their feeding, and devour the whole of it. A disposition to associate continues with them till they have changed their last skins, when they usually separate, each endeavouring to provide in the best manner for itself. At this period they are most exposed to various enemies, and most frequently attacked by the *Ichneumon Fly* (vide fig. 14, 15.). We sometimes find a few continuing together to the last, when each spins a separate web, in which it changes to *Chrysalis*: this usually takes place about the beginning of June; here, in a state of perfect quietude, it remains about three weeks, when it changes to the *Moth* we have already described.





EXPLANATION OF THE PLATE.

- Fig. 1. The eggs laid by the female Moth, and covered by the down from its tail:
2. The eggs with the down removed.
 3. The young Caterpillars suspending themselves by a single web from their mouths.
 4. Shews the manner in which the young Caterpillars feed from the time they are hatched till winter, by eating the surface and fleshy part of the leaf, and leaving the membranous and veiny part.
 5. The general bag or nest of one brood of Caterpillars as it appears in winter.
 6. Some of the Caterpillars as they appear on their first coming out in the spring:
 7. A full-grown Caterpillar.
 8. The same, having spun a web, and about changing to Chrysalis.
 9. The same, changed to Chrysalis, and taken from the web.
 10. A male Moth, produced from the Chrysalis:
 11. A female of the same species:
 12. A dead Caterpillar of the same species, having been stung by an Ichneumon Fly:
 13. The web which the Caterpillar had spun, as at fig. 8: opened to shew the little bags which the Ichneumon Caterpillar, proceeding from its body, had spun to chrysalize in.
 14. The Ichneumon Fly of its natural size, produced from a Chrysalis inclosed in one of the said bags or cases.
 15. The same magnified.



